

DOCKET NO.: TIC-0073
Application No.: 10/508,915
Office Action Dated: April 6, 2006

PATENT

Amendments to the Drawings

The attached sheets of drawings include changes to FIG. 1. The sheets, which include FIGs. 1, 2A, 2B, 2C, 3A, 3B and 4, replace the original sheets including FIGs. 1, 2A, 2B, 2C, 3A, 3B and 4.

Attachment: 4 Replacement Sheets

REMARKS

After entry of the foregoing claim amendments, claims 1-4 will be pending in the application. Claims 1-4 have been amended. No new matter has been introduced.

The drawings stand objected to under 37 C.F.R. § 1.83(a) for allegedly failing to show every feature of the invention specified in the claims. In particular, the Office Action contends that “the oscillator 17 [must be shown] connected to the control signal [generator] 23” because “claim 4 recites the limitation that is not shown in figure 1” (Office Action dated April 6, 2006 (“Office Action”) at ¶ 1). Without conceding the merits of the objection, Applicant has amended FIG. 1 as suggested by the Examiner in an effort to facilitate prosecution. Support for the amendment may be found on page 18, lines 16-20 and in FIG. 4 of the specification, for example. No new matter has been introduced. Accordingly, Applicant respectfully requests that the objection be withdrawn.

Claims 1, 2 and 4 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 5,012,490 (“Myer”) in view of U.S. Patent No. 5,774,555 (“Lee”). Claim 3 stands rejected over Myer in view of Lee and in further view of U.S. Patent No. 4,760,346 (“Kultgen”).

As amended, independent claims 1 and 4 recite, in part, a receiver for converting a received signal directly to a baseband signal, the receiver having a switched capacitor filter, a phase locked loop (PLL) circuit comprising a first divider, wherein the PLL circuit generates a periodic signal of a predetermined frequency according to an output signal from the first divider and a periodic signal generated by an oscillator, and a second divider further dividing the periodic signal generated by the PLL circuit according to the received signal, wherein the output signal from the second divider is provided as the control signal for a switched-capacitor element. Dependent claim 3 recites the switched-capacitor filter comprising at least an amplifier, and a resistor element, which functions as a feedback resistor of the amplifier and is realized by the switched-capacitor element. Thus, the claimed invention provides, in a direct conversion system, a receiver with a baseband filter that is capable of being easily applied to various receiving signal bands, and that is suitable for semiconductor integration.

In contrast to the claim limitations recited above, Myer describes a receiver having a time varying filter 405 that receives a waveform 507 from a filter bandwidth controller 440

(Myer at col. 5, ll. 16-18; FIGs. 4 and 5). As shown in FIG. 6, time varying filter 405 includes a resistive charging source, which is formed from a switched capacitor 607 and transmission gates 605, 610, 615 (*Id.* at col. 6, ll. 64-67). By changing the value of the resistive charging source, the bandwidth of time varying filter 405 may be adjusted (*Id.* at col. 6, ll. 3-29). As described in Myer, waveform 507 is applied to an input of voltage controlled oscillator 630, which controls the resistive charging source via clock signals CL1, CL2 at transmission gates 605, 610, 615 (*Id.* at col. 5, ll. 67-68; col. 6, ll. 1-5 and 17-20). Thus, as acknowledged in the Office Action, Applicant respectfully submits that Myer does not disclose, teach, or suggest a second divider further dividing a periodic signal generated by a PLL circuit, wherein the output signal from the second divider is provided as the control signal for the switched-capacitor element.

Lee describes an apparatus that includes a switched-capacitor band-pass filter (SC BPF) 100, a phase-locked loop (PLL) 200, and an envelope detector 50 (Lee at col. 3, ll. 23-31; FIG. 2). PLL 200 includes a frequency divider 10, a phase detector 20, a low-pass filter (LPF) 30, and a voltage-controlled oscillator (VCO) 40 (*Id.*). VCO 40 oscillates at a frequency in accordance with an output signal from LPF 30 (*Id.*). An output frequency f_{vcc} from VCO 40 is divided by frequency divider 10 and fed back to phase detector 20 and LPF 30 in order to lock PLL 200 (*Id.* at col. 4, ll. 25-30; FIG. 2). In addition, output signal f_{vcc} of VCO 40 is applied as a clock signal to SC BPF 100 (*Id.* col. 4, ll. 44-46). Thus, Applicant respectfully submits that Lee does not disclose, teach, or suggest a second divider further dividing a periodic signal generated by a PLL circuit, wherein the output signal from the second divider is provided as the control signal for the switched-capacitor element and therefore even assuming, *arguendo*, that the teachings of Myer and Lee could have been combined by one skilled in the art as proposed by the Examiner, the invention as recited in independent claims 1 and 4 would not result.

Kultgen describes a summing amplifier for removing unused input ports from the circuit (Kultgen at col. 1, ll. 65-68). With respect to dependent claim 3, the Office Action contends that Kultgen teaches “a resistor $R_{sub f}$ (Fig. 3b), which functions as a feedback resistor of an amplifier, [and] is realized by the switched-capacitor element (Fig. 3b)” (Office Action at ¶ 4). Applicant respectfully disagrees and submits that FIG. 3B merely depicts resistor R_f , in parallel with a capacitor, in the feedback loop of an amplifier and therefore

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does not teach a resistor element that is realized by a switched-capacitor element. Thus, for this reason as well, claim 3 is allowable.

Applicants further submit that claims 1-4 are patentable over the combination of the cited references for the additional reason that the Examiner has not provided a suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the reference teachings. Instead, the Examiner has relied on general citations, such as "it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate a divider used for a control signal as taught by Lee *et al.* into Myer's receiver in order to reduce costs and improve accuracy" (Office Action at ¶ 3). The general citations provided by the Examiner do not provide the requisite teachings, suggestions or motivations to combine the teachings of Myer, Lee and Kultgen in the manner contemplated by the Examiner and therefore are insufficient to render claims 1-4 unpatentable over the cited references.

Accordingly, Applicant respectfully submits that claims 1, 3 and 4 are patentable over the cited references and are, therefore, allowable. Additionally, as claim 2 and 3 depend from claim 1, Applicant further submits that the dependent claims are allowable. Reconsideration of the application and issuance of a Notice of Allowability are respectfully solicited.

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